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ABSTRACT

This update reports on the technology available in New York's public schools. Data and figures are provided for the following measures: total number of microcomputers in New York State public schools; percent of old and new computers; ratio of students to technology resources; number and percent of schools having at least one of a given type of technology; percent of regular technology use for 1992-93 and 1993-94; ratio of students to various technology resources, by percentage of minority students in the school; and percentage of student and teacher use of technology by percentage of minority students. Results show that the number of technology resources has continued to grow in New York's public schools. Microcomputer, laser printer, and CD-ROM acquisition all showed significant increases. Some form of networking/distance learning takes place in 13% of the school buildings in the report. It was found that over 72% of students and 50% of teachers now use computers regularly. However, though these figures did show a slight improvement, inequities in technology access for minority students continued, with the highest minority student population buildings having the least access to technology. Five tables and two figures illustrate findings. (MAS)

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Technology Update--1994

New York State Public Schools

New York State Education Department
Instruction and Program Development Team 1
Albany, NY
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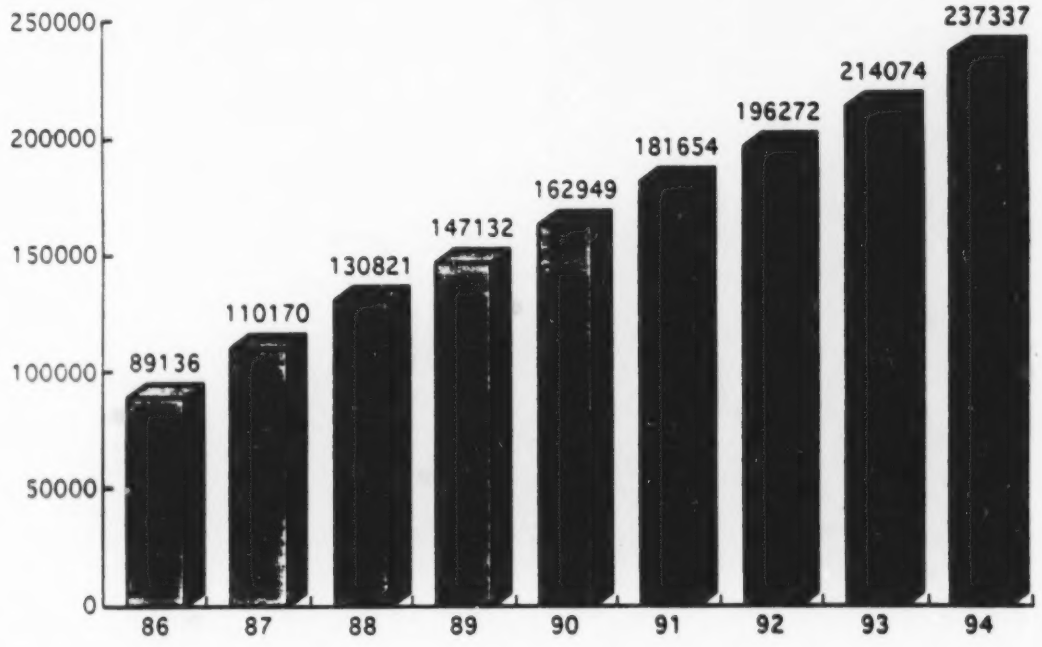
Technology Update--1994

Making Progress

During the past year, the number of technology resources has continued to increase in New York State public schools. As the first graph shows, the number of microcomputers has grown at a steady pace over the past 9 years, with over 237,000 computers now in schools.

Graph 1

Total Micros in NYS Public Schools
1985-86 to 1993-94



Of the total number of microcomputers in schools, a large, but decreasing percentage are older microcomputers. These older machines are predominantly Apple II's (along with a combination of other first generation machines) which have limited capability to support more sophisticated multimedia applications. It is the multimedia and networking applications which offer the most promise for engaging students and teachers in more active learning experiences. These kinds of applications, however, require newer, more powerful machines to support them. The following graph (Graph 2) indicates the percentage of older and newer machines for the past two years. In 1992-93, only 26.2% of the microcomputers were newer machines, while this year, over 32% were newer systems. It is important to note that even within the "newer" category, there is a considerable range of computing power represented.

Graph 2

% of All Micros which are "Old" and "New"

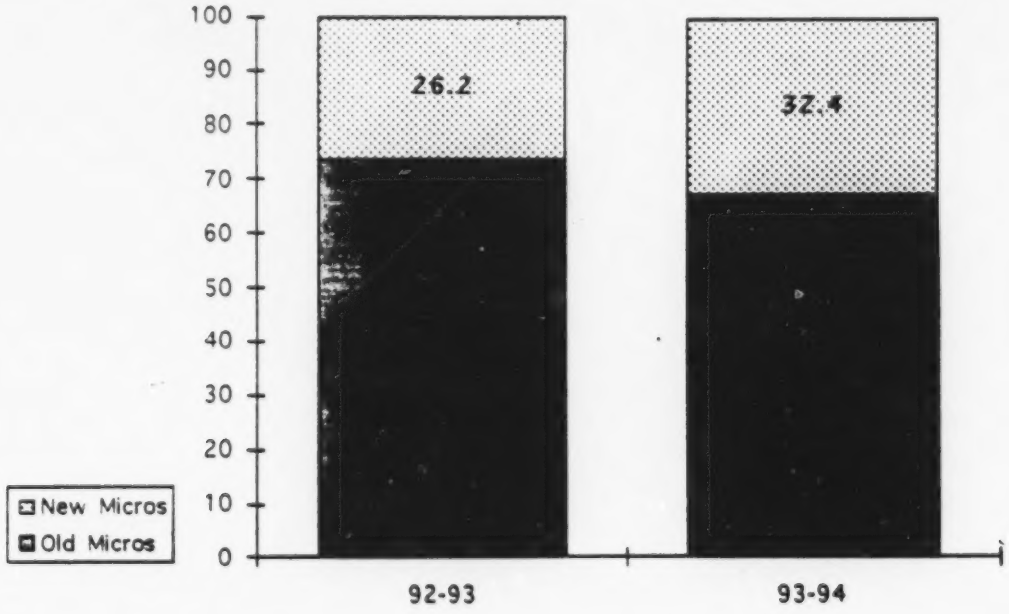


Table 1 on the next page presents the total count for various technology resources, as well as the ratio of students to each of the technology resources.

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Table 1

Technology Resources in K-12 Public Schools
Count and Ratio of Students to Resource
1993-94

Technology Resource	Statewide Total in 1993-94	Ratio of Students to Resource
Old Micros	132,788	19.9 to 1
New Micros	76,795	34.4 to 1
All Micros	237,337 *	11.1 to 1
Laser Printers	6,492	407.0
CD-ROMS	6,323	417.8
VCR's	30,761	85.9
TV's	42,516	62.1
Books	42,372,549	1 to 16.0

* Note that some computers collected under the "Other Category" in the original data collection instrument could not be categorized as either "old" or "new."

The overall ratio of 11.1 to 1 for microcomputers is an improvement from the prior year's 12.2 to 1 ratio, and a significant change from the 24 to 1 ratio which was reflected in the 1985-86 school year. There were significant increases in the number of new micro computers acquired this year, as well as in the number of laser printers and CD-ROM's. The number of CD-ROM's jumped by over 100% from last year's 2,919 to this year's 6,323. CD-ROM's are technology resources which provide for multimedia capability, and are a critical technology tool for both students and teachers. There was little change seen in the ratio of students to video equipment or books.

Table 2 presents the number (and percent) of public schools in both 1992-93 and 1993-94 with at least one of each technology resource. This table indicates that there has been growth in access to various technology resources, with nearly 100% of the schools having at least one microcomputer or TV. On the other hand, data from this year show that 44% of schools do not have a CD-ROM player and 38% do not have laser printers. In many of the technology resource categories, there has been a gradual increase in the number of resources, although there are many school buildings without a particular technology resource.

Table 2

Technology Resources in K-12 Public Schools 1992-93 to 1993-94

Technology Resource	1992-93 # of Schools Having Resource	% of All 3,906 Schools Having Resource	1993-94 # of Schools Having Resource	% of All 3,906 Schools Having Resource
Old Micros	3,796	97%	3,779	97%
New Micros	3,176	81%	3,405	87%
Any Micro	3,895	99%	3,892	99%
Laser Printer	1,990	51%	2,415	62%
CD-ROM	1,545	40%	2,189	56%
VCR	3,709	95%	3,723	95%
TV	3,860	99%	3,864	99%
Cable TV	2,802	72%	2,908	74%
Public TV	3,371	86%	3,384	87%
Satellite	101	3%	125	3%
Distance Learning	400	10%	516	13%
Computer in Library	2,836	73%	3,027	77%
Computer in Library w/Modem	1,224	31%	1,390	36%
On-line Public Access to Library Catalog	429	11%	578	15%

Table 2 indicates the # and % of schools having at least 1 of a technology resource, based on 3,906 Schools

The data from the State Education Department's Basic Educational Data System (BEDS), upon which much of this report is based, indicate that 13% of the school buildings are involved in some form of networking/distance learning. Data from a BOCES survey on distance learning (December 1993) show that 138 school districts are involved through BOCES interactive distance learning programs and that these programs involve over 100 different courses being taught to 10,770 students across the state (excluding the Big Five Cities). At the present time 22 of the 38 BOCES offer some form of distance learning, with 11 of those BOCES projects using 2-way interactive fiber optics or microwave delivery systems.

Examining data on the use of technology (Table 3) we see that over 72% of students and 50% of teachers now use computers regularly, and that this percentage is gradually increasing. At the same time, we can see a decrease in the percentage of teachers using television in the classroom, perhaps as a result of displacement of learning time by computers and other technology.

Table 3

Regular Technology Use	Percentage Use in 1992-93	Percentage Use in 1993-94
Student Computer Use	69% of all students	72% of all students
Teacher Computer Use	47% of all teachers	50% of all teachers
Teacher TV Use	48.2% of all teachers	47.7% of all teachers

Table 4 shows the ratio of students to various technology resources, broken down by the percentage of minority students in the school building. This analysis is important to identify continuing inequities in technology access for minority students. As is demonstrated in Table 4 there is a continuing negative relationship between the percentage of minority students in a school building and the technology resources in that building, with the highest minority buildings having the least access to technology.

Table 5 presents the percentage of student and teacher use of technology by percentage of minority students in a building. Again the same negative relationship is seen between technology use and percentage of minority students.

Table 4

Relationship of % Minority in a Building and Technology Resources

Ratio of Students to:	0-20% Minority	21-40% Minority	41-60% Minority	61-80% Minority	81-100% Minority
Old Micros	16.2 to 1	18.6 to 1	22.1 to 1	26.6 to 1	29.3 to 1
New Micros	29.3 to 1	32.0 to 1	36.6 to 1	35.9 to 1	50.0 to 1
Any Micro	9.4 to 1	10.7 to 1	12.1 to 1	12.8 to 1	15.5 to 1
CD-ROM's	317.4 to 1	517.7 to 1	482.6 to 1	518.7 to 1	699.6 to 1
Laser Printer	367.7 to 1	410.8 to 1	351.4 to 1	401.1 to 1	543.1 to 1
TV's	44.7 to 1	52.7 to 1	72.9 to 1	103.4 to 1	152.8 to 1
VCR's	62.8 to 1	72.4 to 1	114.4 to 1	119.5 to 1	196.0 to 1
Printed Books Per Student	19.9 per Student	18.6 per Student	13.4 per Student	12.2 per Student	10.0 per Student

Table 5

Relationship of % Minority in a Building and Technology Use

Percent Using Resource	0-20% Minority	21-40% Minority	41-60% Minority	61-80% Minority	81-100% Minority
Student Computer Use	78%	76%	71%	67%	59%
Teacher Computer Use	61%	54%	45%	42%	28%
TV Use by Teacher	57%	53%	42%	40%	31%

These figures show a slight improvement in almost all categories of technology use by percentage minority from last year to this year. As with most of the technology resource and use data, students and teachers in 1993-94 had increased access to technology and used it more frequently in schools. Nonetheless, given the present, relatively slow growth and replacement rate of technology, it is likely to be a number of years before students and teachers have the level of access envisioned in the State's *Long Range Plan for Technology*.

The data in this report came from the 1993-94 School Basic Educational Data System Survey

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